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Laura Rondi, Brian Sack, Fabio Schiantarelli, Alessandro Sembenelli

CONSIGLIO NAZIONALE DELLE RICERCHE

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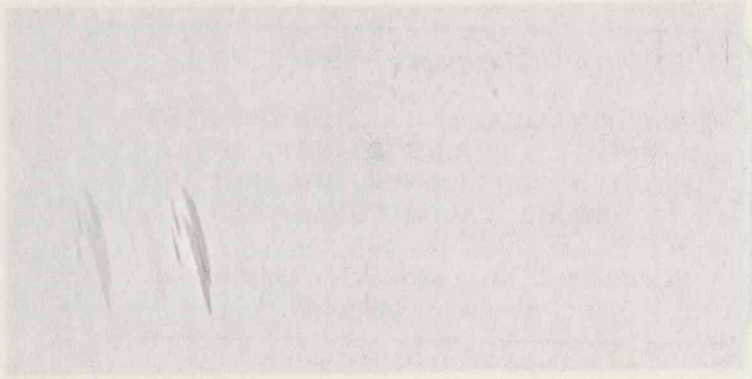

FIRMS' FINANCIAL AND REAL RESPONSES TO BUSINESS CYCLE SHOCKS AND MONETARY TIGHTENING: EVIDENCE FOR LARGE AND SMALL ITALIAN COMPANIES

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1. Introduction

How do firms react to adverse macroeconomic shocks, including monetary tightening? How does the response vary across different types of firms? These are the two questions we address in this paper. In a world of asymmetric information and costly contract enforcement, adverse macroeconomic shocks worsen agency problems between borrowers and lenders, basically because they reduce the value of collateralizable net worth. This either limits or makes more costly the access to external finance, relative to internal finance, with negative consequences for firms' production and investment decisions. The worsening of credit conditions may therefore amplify the negative effect of downturns relative to a situation of perfect capital markets[1].

The increase in the premium for external finance is unlikely to be uniformally distributed across firms. The firms characterized by more severe information problems and low initial levels of collateral will be those who will more adversely affected. These firms will find it more difficult or more expensive to obtain external finance to smooth out negative shocks and are likely to display a greater sensitivity of their real choices to variables that capture their financial health.

Recent empirical evidence for the US suggests that the amount of short-term debt received by small firms decreases more sharply relative to large firms in response to monetary tightening[2]. Moreover their inventories drop more quickly at the onset of a recession, while large firms are able initially to accumulate inventories. Small firms' inventory investment is also more sensitive to balance sheet variables[3]. Finally the reduction in sales that accompanies periods of monetary stringency and/or recessionary episodes is more severe for small firms.

Whereas a fair amount is known about firms' responses to cyclical fluctuations in the US, little evidence is available on these issues for other countries. Moreover, even for the US most of the results concern, on the financial side, the behavior of bank lending and of the commercial paper markets and, on the real side, sales and inventories[4]. What is necessary is a fuller analysis of

1 See, for instance, the theoretical contributions by Bernanke and Gertler (1989), Gertler (1992), and Kiyotaki and Moore (1993).

2 See the contributions by Gertler and Gilchrist (1991, 1993a, 1993b, 1993c) based on data drawn from the Quarterly Financial Reports.

3 See also Kashyap, Lamont and Stein (1992) for evidence from panel data for the US.

4 See Kashyap, Stein, and Wilcox (1993) and Oliner and Rudebusch (1992) for an analysis of the changes in the composition of short-term debt between bank lending and commercial paper following monetary tightening.

the cyclical response of trade credit received and of short-term financial assets (including trade credit given), since increases in the former and adjustments in the latter may be important ways for firms to smooth out adverse shocks[5]. In addition it would be useful to have evidence on the response of all sources of funds (including retentions and new share issues), in order to understand how the financial overall adjustment strategy differs across firms' types. Finally, the analysis of the behavior of short-run investments (like inventory accumulation) must be complemented by an analysis of how the response of fixed investment to financial factors varies over time for different types of firms. Whereas much is known about inter-firm differences in the sensitivity of fixed investment to financial constraints, less is known about how such sensitivity depends upon the phase of the business cycle or upon the monetary policy stance[6].

In this paper we present evidence on all these issues using annual data for two long samples of large and small (quoted and unquoted) Italian private companies, available for the period 1968-1991. The data have been collected by Mediobanca and have been obtained by aggregating balance sheet information. The lenght of the sample and the knowledge of the industrial classification for the firms in the two samples are two of the advantages of this data set. One disadvantage is that, since the source of information are companies' balance sheets, the frequency of the data is annual. Another potential disadvantage is that the companies that make up the sample of small firms are quite well established, and this may bias the results against finding significant differences between small and large firms due to different degrees of financial constraints each group faces. However if such differences are found, it is plausible to argue that the heterogeneity in response would be even greater if large firms were compared with newer, less well-known, and smaller companies.

Since Italian firms rely heavily on bank debt and monetary policy has been the main tool of demand management, Italy is an interesting case to study the effects of monetary tightening[7].

5 On the use of short-term financial assets as a source of funds for investment see Fazzari and Petersen (1993).

6 One contribution that provides evidence on the different sensitivity of firms to cash flow in recessions and expansions is Gertler and Hubbard (1988). For an analysis of the excess sensitivity of investment to cash flow for certain types of firms see, among others, Fazzari, Hubbard and Petersen (1988) for the US, Hoshi, Kashyap and Scharfstein (1990) for Japan, Devereux and Schiantarelli (1989) for the UK. The importance of capital market imperfections has been confirmed in the contest of the Euler equation approach (see Bond and Meghir (1990) for the UK, Gilchrist (1990) and Whited (1992) for the US, Galeotti, Schiantarelli and Jaramillo (1992), Rondi, Sembenelli and Zanetti (1992), Cristini (1993) for Italy).

7 Although bank debt is very important in Italy, close links between banks and industrial firms are not as common

Moreover, both the stock and the bond markets are not as developed as in the US or in the UK for a set of structural reasons, including the tax treatment of interest and dividend income. This means that negative supply shocks to bank credit are likely to have powerful effects. Moreover, during the second half of the seventies and the first half of the eighties the Central Bank used quantity controls on bank portfolios to directly influence the supply of credit. The use of such controls, together with the need to keep financing substantial government budget deficits, implied that monetary contractions could generate powerful effects on the availability and cost of bank credit.

The plan of the paper is as follows. In section 2 we describe in detail the data used in our empirical work and present some useful descriptive statistics on the basic characteristics of the Mediobanca samples of small and large firms. In particular we discuss the structure of their liabilities and assets and the composition of the sources of internal and external finance.

Section 3 is the core of the paper and it contains three pieces of empirical evidence that throw light on the heterogeneity of firms' responses to business cycle shocks. The first piece of evidence consists of cross-correlations between sample specific indicators of demand growth, on the one hand, and the rate of growth of sales, inventories, different types of debt, short-term assets, new share issues and retentions on the other. We also discuss the cross-correlations with the mix of different types of liabilities and with the composition of the sources of funds.

The second piece of evidence is obtained from regressing all the variables described above on contemporaneous and lagged dummy variables that capture periods of monetary tightness. A detailed description of monetary policy in Italy and of the qualitative and quantitative evidence we have used to construct the stringency dummies is contained in an Appendix to the paper[8].

The last piece of evidence we present consists of econometric results on the time and cross sectional variation in the excess sensitivity of inventory investment and fixed capital investment to changes in proxies for credit worthiness. We use the ratio of cash flow to interest payments to proxy for the latter and estimate both equations in an error correction form. In section 4 we summarize the main results and provide some conclusive remarks.

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as in Japan and Germany.

8 See Romer and Romer (1989) for a seminal contribution in constructing and using qualitative proxies for monetary stringency for the US.

2. Data and Descriptive Statistics.

The empirical analysis in this paper is based on annual balance sheet data collected by Mediobanca for a closed sample of 974 private companies, mainly in the industrial sector, over the period 1968-1991. The firms in the sample account approximately for 20% of value added in manufacturing. The length of the period covered, and the opportunity it provides to analyze the response to several contractionary episodes, are other attractive features of this data set. The sample is divided into two size categories, and aggregate data are available for two sub samples of 779 large(r) and 195 small(er) firms. In order to be classified as small, a firm has to be independent from industrial groups, must have total sales of less than 10 billion lira and a capital stock less than 1 billion lira in 1968, and total sales less than 100 billion lira, capital stock less than 30 billion lira, and less than 1000 workers in 1991. The average employment size is 143 workers for small firms and 876 workers for large firms. Micro firms are absent from the sample, and in an Italian context what we call small firms could be considered medium-sized.[9] Yet, the size differential between the two groups of firms is substantial, and so are other characteristics. In order to be included in the sample a firm must have been in existence for the 1968-1991 period. If a firm merges with another firm, the two joined firms are considered as a single entity for the entire period. If a firm goes bankrupt, which is quite rare in the Italian context, it is eliminated from the sample. If a firm that is below the initial ceilings grows beyond the specified final limits is classified as a large firm. However , the distribution of small firms relative to the ceilings is such that a firm can have a high growth rate and yet remains classified as small. The overall impression one obtains from the descriptive statistics discussed in detail below is that the small firms in the sample are more dynamic and more profitable than large firms. This means that we are dealing with a group of small companies that have been fairly successful. In this sense the nature of the data may bias the results against finding differences in behavior between small and large firms due to capital market imperfections. If significant differences are found and can be reasonably imputed to different degrees of financial constraint , this means that capital market imperfections are likely to be of even greater importance for those smaller, younger, and riskier small firms not included in the sample.

9 Actually Mediobanca calls these firms "medie".

In Tables 1 through 3 we summarize some of the characteristics of the sample of small and large firms in order to understand the main distinguishing characteristics between the two samples. From Table 1 small firms appear to be more profitable than large firms, and this is particularly true in the seventies. The growth rate in sales is greater for small firms. The investment rates are identical in the eighties, and greater for small firms in the seventies. Large firms export a bigger share of total sales than small firms in both periods, although the gap has been closing in the eighies. The inventory to sales ratio is larger for smaller firms, reflecting probably the greater efficiency of larger firms in handling inventories. Total trade credit extended by smaller firms as a proportion of total assets is also higher for small firms. The cash to total assets ratio is larger for small firms and has increased over time, while large firms hold more treasury bills and have increased their holdings in the eighties (this occurs for small firms as well). The larger proportion of liquid assets held in cash by small firms may be suggestive of their lower efficiency in handling their short-term financial assets.

The overall degree of leverage and the importance of bank debt does not differ much between the two classes of firms. In both cases firms had become heavily indebted to banks in the seventies and had subsequently decreased their degree of leverage in the eighties. However Table 2 suggests that there are significant differences in the composition of debt between large and small firms. In particular, the maturity structure of debt varies substantially across firm size. Small firms depend more heavily on short-term debt, which represents approximately 80% of total debt compared to 70% for large firms. This is due to the greater importance of both short-term bank debt and of trade debt for small firms, with each component representing about a third of total debt. The shorter maturity of bank debt is to be expected for agents that suffer more from informational asymmetries, since it allows banks to monitor more frequently the performance of the borrower. The greater importance of trade debt is also consistent with the fact that suppliers may be in a better position, because of repeated and close interactions, to acquire information about borrowers.

Long-term bank debt is a more important source of finance for large firms, which have also experienced in the eighties an increase in the share of group debt. Marketable debt represents a less important source of finance for both groups[10]. The reliance of Italian firms on bank debt is

10 The share of long-term market debt is marginally higher for small firms, because, for tax reasons, owners' stake takes sometimes the form of holding of bonds and not shares.

much greater than for U.S. and U.K. firms, similar to French and German Firms (although marginally higher), and smaller than for Japanese firms (see Bonato, Hamaui, Ratti (1993)). The importance of bank debt is partly due to the tax disadvantages of issuing bonds. The item "short term other debt" in Table 2 includes pension liabilities, taxes due, and other accounting adjustments which are sizable but not very informative for the issues we are addressing in this paper.

It should also be noted that the trend over time is for firms of both sizes to use less bank debt relative to total debt. For small firms the figure drops from 46% in the period 1968 to 1979 to 38% in the period 1980 to 1991, and from 46% to 37% for large firms. On the other hand, the use of trade debt falls only marginally from 33% to 32% of total debt for small firms, while it increases from 25% to 30% for large firms.

In Table 3 we summarize the importance of various sources of finance. For both classes of firms new debt accounts for 50% of the sources of funds to both large and small firms. However, while this figure has remained fairly constant for small firms, for large firms the reliance on debt is particularly striking during the seventies. Retained earnings are the second most important source of finance for all firms[11].

Both types of firms increased their reliance on retained earnings in the eighties, although on average this reliance is higher for small firms in both sub-periods, as might be expected in the case of credit market imperfections. Large firms do raise a larger percentage of new funds through new equity than smaller firms (14% versus 10%), and this reflects mainly the increased importance of this source of funding in the eighties.

Overall, the data in these three tables suggest the existence of significant differences in the characteristics of these two sets of firms, in terms of their position in the market for external funds. The heterogeneity we have observed is consistent with the hypothesis that smaller firms are likely to be the one to suffer most from asymmetric information or costly contract enforcement problems, and that may have an effect on the way firms respond to adverse business cycle shocks.

11 If we redefine total sources of funds net of trade debt, retained earnings become the largest item.

3. Response to Business Cycle Shocks and to Monetary Tightening

In this section we investigate the response of different types of firms to aggregate shocks to the economy. In particular we will discuss whether recourse to external financing and to internal buffers helps firms in smoothing out the effect of adverse shocks.

We will rely on three types of evidence. We will start by examining simple cross-correlations (at various leads and lags) of the relevant balance sheet items with an aggregate demand indicator appropriate for the two samples of firms. We then present evidence of the responses to episodes of monetary tightening, using an approach similar to the one used for the US by Romer and Romer (1989). We concentrate on monetary policy since monetary policy has been the main instrument of short-term economic management employed to induce a slowdown in the economy. Finally, we analyze the excess sensitivity of firms' real choices to balance sheet variables, by estimating equations for inventories and fixed investment. The effect of financial factors are allowed to vary across firms and over periods of monetary contraction and expansion.

3.1 Cross-Correlations With Demand

As we have already mentioned, one of the advantages of the Mediobanca sample is that we know its industry composition. This is important because one has to guard against attributing to capital market imperfections what is due to industry effects. In Table 4 we summarize the percentage of small and large firms in the sample belonging to 17 different sectors. A third of small firms (33.2%) belongs to the consumer non-durable sector, excluding chemicals and pharmaceutical products (the figure is only 18.5% for large firms). A large percentage of small firms (21%) belongs to the mechanical engineering sector, while large firms are mainly located in the transportation equipment and electronic and electrical engineering sectors (18.8% and 14.2% respectively). The overall impression is that, on average, it is not true that small firms are found in sectors characterized by greater demand volatility. This is confirmed by comparing the variances of two different measures of weighted aggregate production growth rate, each one calculated by aggregating sectoral growth rates of production from National Accounts, using the industrial composition of each of the two samples of small and large firms as weights. The variance of the weighted production index is .0022 for large firms and .0019 for small firms.

In Table 5 we present the simple cross-correlation coefficients between the real growth

rate in various balance sheet items and the growth rate of the two weighted indicators of demand, at various leads and lags (all variables have been detrended).[12] In the table r(m) represents the correlation coefficient between the growth rate in the balance sheet item at time t and the rate of growth in the aggregate weighted index of production at time t+m.

Sales are obviously strongly procyclical for both groups of firms, although changes in small companies' sales seem to be more responsive to aggregate output fluctuations. As far as inventories are concerned, whereas for small firms r(0) is positive and significant (at the 10% level), consistent with a contemporaneous decrease in inventories in a downturn, only r(-1) is significant for large firms, suggesting that the decrease in inventories occurs one year later for them. There is also weak evidence that large firms actually accumulate inventories the year preceding recessions (r(1) is negative, but not significant). As we discuss in the appendix, in Italy recessions are usually preceded by monetary tightenings. Hence the data seem to suggest that the initial reaction of large firms to a tightening is to increase inventory, while this does not occur for small firms. The positive correlation coefficients with investment indicate that fixed investment moves together with demand, although their timing suggests that small firms adjust investment plans more quickly than large ones.

Total debt and short-term debt are strongly pro-cyclical for small firms, while the contemporaneous correlation is not significant for large firms. In the case of large firms, furthermore, r(1) is negative and significant for total short-term debt and for bank debt, implying that large firms actually manage to increase short-term debt, and in particular short-term bank debt, in the year preceding the recession. The positive and significant value of r(-1) for bank debt is consistent with large firms eventually experiencing a decrease in bank debt, with a lag of one year. For small firms, r(1) for short-term bank debt is not significant , while r(0) points at a contemporaneous and significant drop in short-term bank debt in recessions. All this is suggestive that for small firms it is more costly or more difficult to rely on bank credit to smooth out business cycle fluctuations, while large firms seem to be relatively more successful in doing that.

Can small firms rely on trade credit in order to compensate the loss of bank credit? The answer appears to be negative, since trade debt also moves pro-cyclically (r(0) is positive and

12 The results would be very similar if we had used a common index for production for the sample of large and small firms. Since disaggregate production indices are available on an homogeneous basis only since 1971, the period 1971-1991 has been used for calculations. Correlation coefficients using balance sheet items deflated with sales also give similar results.

significant). However, r(-1) is negative and significant, suggesting that movements in trade debt may be attenuated or reversed one period after changes in output . For large firms trade debt is also positively and significantly correlated with contemporaneous movements in output, although interestingly there is a negative, although insignificant, correlation at one period lead. This is consistent with large firms being able to increase also trade debt in the period preceding a fall in output. However, on the whole these initial results suggest that it is mainly short-term bank debt and not trade debt that large firms use to smooth out business cycle fluctuations.

Another interesting response on the asset side is the significant positive cross-correlation between treasury bills and production at one period lead for small firms. This is consistent with small firms cutting their holding of short-term financial assets before the recession starts, around the time when monetary stringency occurs. However, at one year lag, there is a significant negative association between output growth and treasury bills growth for small firms, and between the growth of output and of the stock of cash for large firms, that is not easy to rationalize.

The behavior of both long-term bank debt and marketable debt is not very informative, as the cross-correlation coefficients are not on the whole precisely determined.

A further insight into the financial responses of firms to business cycle fluctuations can be obtained by analyzing the cross-correlations between changes in the mix of liabilities and in the mix of various sources of funds , on one hand, and the demand indicators, on the other (see Table 6).For large firms the proportion of short-term bank debt relative to the sum of short-term bank debt and trade debt is negatively associated with output movements at one period lead and contemporaneously (in the latter case the correlation is also significant). At one period lag the movement starts being reversed, thus confirming previous results. The cross-correlation is negative and significant at one period lead also for small firms, is basically zero contemporaneously, and is strongly positive at one year lag. These results suggest that in the year preceeding the recession the fall in trade debt is even greater than the fall in bank debt, although this is reversed the year following the recession.

Looking at the maturity of bank debt, the success by large firms in obtaining short-term bank debt is reflected in negative and significant value for r(1), which is consistent with a shortening of the maturity of liabilities to banks in the period preceding falls in output.

Interestingly this is not true for small firms.

The most informative change in the sources of funds occurs for retentions. The proportion of retentions appears to be strongly counter-cyclical for small firms (r(0) is negative and significant), suggesting that in bad times this type of firms are forced to rely more heavily on internal sources. For large firms the positive value and significance of r(1) is consistent with the evidence presented before that, when an episode of monetary stringency occurs, large firms are able to have access initially to short-term debt. No significant movements are observed for new share issues for either category of firms.

3.2 Responses to Monetary Tightness Dummies

In this section we will present evidence on firm responses to episodes of monetary tightening. The setting of monetary policy in Italy does not only reflect the decisions of the Central Bank, but also Government decisions concerning the deficit, particularly because until 1981 the Central Bank in Italy was by law the residual buyer of treasury bills. In this sense the overall stance of monetary policy often depended upon the budgetary decisions of the government. However, it remains true that monetary policy was the key instrument used to respond to balance of payment problems and to inflationary pressure.

In the Italian context it is not possible to find a single indicator of the stance of monetary policy that is valid over the entire period we are analyzing, since significant changes have taken place in the definition of intermediate targets and in the methods of control used (including administrative restriction on banks' portfolio and capital movements). The results we present here are based on the identification of periods of tight monetary and credit conditions, using an approach similar to the one used for the US by Romer and Romer (1989). We use qualitative evidence (including the statements contained in the Annual Reports of the Bank of Italy) and quantitative evidence on interest rate, credit and money aggregates to identify both the beginning and the duration of contractionary episodes. Although we can identify periods of monetary restriction fairly precisely, the frequency of the balance sheet data available to us is only annual. Obviously the nature of the data suggests that caution must be exercised in interpreting the timing of firms' responses. In the Appendix we summarize the institutional context for monetary policy in Italy and the main developments that have occurred during the period under

investigation, and describe in detail the identification of the tightness episodes. On the basis of the available evidence we have identified 1970, 1974, 1976-1977, 1980-1981, and, possibly, 1986 as periods of tight money.

In order to investigate the response to shocks of small and large firms, we have regressed log-difference of each balance sheet item of interest on its own lagged value, on the contemporaneous, once lagged and twice lagged value of the tightness dummy , and a trend. The estimated parameters have been used to calculate the impulse response function for the log level of each variable (in real terms) to one additional period of stringent money and credit conditions.

In the Appendix we have discussed how monetary policy has responded mainly to balance of payment and inflationary problems, and how monetary contraction has been followed (with the exception of the 1986 episode) by a contraction in output. Indeed, if we create a dummy variable that equals one in years of GNP decline, the correlation coefficient between it and the lagged tightness dummy equals .74. In this sense the monetary stringency dummy summarizes the effects of shocks other than domestic monetary ones. However, it goes beyond the scope of this paper to attempt to identify with precision the separate effect of different types of business cycle shocks, and in any case this is not central to our overall argument.

In Table 7 we summarize the main results. T denotes the tightness dummy. The reaction of sales to a tightening differs across small and large firms, both in terms of the significance and size of the decline. The once-lagged dummy is significant at the 2% level for small firms and is insignificant even at the 10% level for large firms. The marginal significance level for the F test of joint significance of the tightness dummies is 6.9% for small firms and 41 % for large firms. The impulse response functions suggest that the decline in the level of sales for small firm is approximately 3 times the decline for large firms (6% versus 2% after one year).

There is also an interesting difference between firms in the response of inventories to shocks. During the year of the tightening, large firms actually increase inventories by over 4%, although this increase is not statistically significant. In the year following the restriction, small firms have decreased their inventories by about 6.5%, while large firms have allowed inventories to fall by less than 2%. After two years the response of inventories is more alike, and actually large firms decrease their inventories by slightly more than small firms.

The total amount of debt accruing to large firms is largely unaffected by a monetary

restriction, but small firms experience a significant decrease in their total debt. The pattern is similar for short-term debt. A monetary restriction does not significantly affect the growth rate of short-term debt for large firms, while the inclusion of the restriction dummies (and lags) is significant at the 5% level for small firms.

If we look at the different components of short-term debt, we see that one of the reasons for its decrease for small firms is the fall in trade debt. Such a decrease is significant for small firms and not significant for large firms. The figures in Table 1 and 2 also suggest that all firms provide substantial amounts of trade credit, and actually are net suppliers of trade credit. The amount of net trade credit extended by large firms decreases, while the net trade credit of small firms rises slightly after a contraction. However, the response for both types of firms is not statistically significant.

The results concerning trade debt (and also net trade credit) throw some light on an hypothesis advanced in the literature on the role of large firms as financial intermediaries. It has been suggested (see, for instance, Jaffee and Stiglitz (1990)) that large firms may play the role of supplier of trade credit to small firms, since large firms have an easier access to bank or other credit than small firms. The figures in Table 1 and 2 imply that trade credit given, net of trade credit received, is a higher percentage of total assets for small firms (11.75%) than for large firms (7.89). However this may be simply due to the different industrial composition of the sample. What is more interesting is that the sharp and significant decrease in trade credit received by small firms, following monetary tightening, and the decrease in net trade credit provided by large firms are not consistent with transfer of financial resources from large firms to small firms occurring at a time when small firms are more likely to need it.

Small firms do not fare much better when it comes to the other major source of short-term debt, short-term bank debt. As with trade debt, the coefficient on the tightness dummy lagged once is negative and significant, causing a 10% decrease in the level of debt for small firms after one year, compared to a 3% (and not significant) decrease for large firms. In the first year large firms experience an increase of 2.4%, but the increase is not significant. The greater fall in short-term bank debt for small firms occurs in spite of the attempt by monethary authorities to soften the effect of credit restrictions on small firms (by imposing, for instance, differential ceilings to the

expansion of loans according to their size)[13].

The steeper fall in sales, the inability to accumulate inventories even temporarily, and the sharper decrease of the amount of debt obtained by small firms confirm the picture that had emerged from the correlation with demand fluctuations we have discussed above. The pattern of responses is consistent with the implications of the theories that emphasize the existence of informational asymmetries in the capital markets. The basic idea is that firms that face informational problems (and small firms are more likely to be in this situation) may be denied access to loans or may have to pay a premium for external finance. This premium is counter-cyclical since a monetary tightening, or any other adverse business cycle shock, would reduce a borrower's collateral relative to his balance of outstanding loans, causing an increase in the premium on external funds (or a decrease in their access to external funds). Although there are other possible explanations for this type of responses, they are less plausible. For instance, it may be that demand, and hence sales, are more volatile for those sectors in which small firms in our sample are prevalently located. However, as already mentioned, the analysis of the industrial composition of our sample of small and large firms does not suggest that small firms are more concentrated on average in sectors characterized by wider cyclical oscillation in demand. Nevertheless, one cannot exclude that other explanations may exist. We will return to this issue in the next section and present additional evidence bearing on it. We now complete the picture of the response of firms to tightness episodes, looking at other items of their balance sheet.

The response of cash and treasury bills holding is not precisely estimated for either set of firms. The only response approaching significance (and interesting in terms of magnitude) is the one for treasury bills holding by large firms. The result suggests that large firms have increased substantially their holdings, following monetary tightening. One possibility is that large firms have chosen to make financial investments rather than commit to investment in machines or inventories, which are obviously of longer duration and involve more risk. The same phenomenon does not occur for small firms simply because their funds have dried up or have become more expensive, so they are not making financial or real investments. However, these results (for which we had found no evidence in the previous section) may be simply an artifact of the change in tax legislation. Since interest payments on treasury bills were tax free, firms had the incentive to

13 See the Appendix for a detailed account of the measures adopted in each tightening episode and for a description of the Bank of Italy perception of the success of the policy.

borrow from banks in order to buy treasury bills. This was particularly true between the mid seventies and the beginning of the eighties. However, this is the period in which two of the major monetary tightness episodes are concentrated, so that the stringency dummy may capture also the profitability of tax arbitrage.

In the analysis of long-term financing, the distinctive feature is the opposite responses of the two principal types of debt for large firms. The decline in long-term bank debt is numerically large for both types of firms, but greater for large firms . The coefficients for large firms are also more significant, with the contemporaneous dummy having the only significant coefficient at the 10% level. Long-term marketable debt does not show a well determined pattern for small firms following a restriction. Instead for large firms, it consistently and significantly rises, eventually increasing by some 50%. It is important to keep in mind that this is a small component of long-term debt compared to bank lending, hence there is no corresponding rise in total long-term debt. Even though this is the case, the success of large firms in accessing the market for debt during monetary restrictions is striking. One possible explanation of this result is that large firms have been successful in issuing bonds on Euromarkets in periods of monetary stringency. Unfortunately we cannot directly test this possible explanation since the disaggregation between domestic and foreign debt is not available for our sample.

Another source of funds that a firm directly raises without intermediation of a bank is new equity issues. Here again there is an interesting difference in the response of the types of firms. New issues by small firms are affected very little by a restriction. Large firms, instead, immediately and significantly increase new equity issues. This is an interesting finding that confirms the greater ability of large firms in gaining access to new funds using the stock and bond markets. Retentions decrease significantly for large firms, while for small firms, there is a significant increase (at the 10% level) in retentions the year following monetary tightness. This confirms the results we had obtained on the basis of the cross-correlations with industrial production.

In table 8 we report the results of the regressions of the rate of growth of various mixes on the monetary tightness dummies. It is interesting to note that the proportion of funds obtained by retained earnings declines significantly for large firms, confirming their ability to use external funds to smooth out periods of tightness. The changes for small firms are not significant. The response of the proportion of new issues in total sources is not significant for either groups of

firms, although it positive and sizeable particularly for large firms. Finally, the response of the mix between short-term bank and trade debt is not statistically well determined for either large or small firms.

In some papers the increased relative importance of short-term sources of finance other than bank debt (like commercial paper in the US) following monetary tightening has been interpreted as evidence in favor of the existence of a credit channel for monetary policy[14]. There is no evidence in our data that there are very significant movements in the proportion of bank credit following monetary tightening[15]. Moreover, the cross-correlation with demand suggests that trade debt falls initially even faster than bank debt. However this cannot be taken as evidence that a credit channel in the transmission of monetary policy is not operative in Italy. The use of direct controls on credit expansion, the need to finance the government budget deficit (that means that credit to firms would be seriously curtailed during episodes of restriction), the narrowness of security markets and the limited importance of non-bank financial intermediaries would suggest exactly the opposite. Our data say that the way in which the credit channel works is that the overall sources of funds (bank and non-bank) are severely curtailed for certain categories of firms (the smaller ones in our case). The fact that also trade credit decreases for small firms (possibly at an even faster pace) means that they get hit twice during monetary contractions, first, because the amount of bank debt they receive decreases, second, because large firms eventually feel the punch of monetary tightening, and put the squeeze on the amount of trade credit they provide.

The results we have described in this section are robust to different specifications of the tightness dummy. More specifically, the basic conclusions are not altered if we exclude the rather short 1986 restrictive episode. Moreover, the basic conclusions are not altered if we distinguish between more and less severe tightness episodes (1974 and 1976-1977 could probably be defined as more restrictive episodes). Finally, similar results are obtained if the rate of growth of Total Domestic Credit or of Credit to the Economy are used as explanatory variables in the regressions.

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14 This is the thesis put forward by Kashyap, Stein and Wilcox (1993) for the US using data not disaggregated by firm size. Oliner and Rudebusch (1992), Gertler and Gilchrist (1993a), (1993b), using data disaggregated by firm size find that the mix does not change for firms in each size category but there is an overall shift of resources to large firms. See Bernanke and Blinder (1988) for a clear statement of the money versus credit channel in the transmission of monetary policy.

15 The empirical papers mentioned in the previous footnote assume that bank debt is more costly than other sources of debt. In Italy trade debt is considered to be cheaper than short-term bank debt by some authors (Marotta, 1992).

3.3 Sensitivity of Firms' Real Choices to Financial Factors: Econometric Evidence from Inventory and Fixed Investment Equations

The nature of the correlations with the weighed indeces of production and of the responses to the tightness dummies are consistent with the existence of differences in the severity of agency problems between small and large firms. In this section we present additional evidence based on the sensitivity of firms' real choices to financial factors. More specifically we estimate simple inventory and fixed investment equations containing, in addition to proxies for demand, the (safe) real rate of interest and the coverage ratio (the ratio between cash flow and interest rate payments). The coverage ratio can be thought of as a proxy for the premium that firms have to pay for external finance and, moreover, indicates the availability of internal funds that can be used to finance investment in inventories or fixed capital (after servicing the debt). We would expect that the coefficient for the coverage ratio is greater for small firms relative to large firms, because the informational and contract enforceability problems are more relevant for the former. Moreover we would expect its coefficient to be greater in times of monetary tightness because it is then that the value of collateralizable assets is low. It is possible that the coverage ratio may also be a predictor of future demand or profitability. However, the cross-sectional or time differences in its coefficient can be more plausibly explained by differences in the severity of financial constraints, rather than by differences in the expectation generation mechanism.The equations have been estimated in an error correction form:

$$\Delta \log I_t = \beta_0 + \beta_1 \Delta \log I_{t-1} + \beta_2 \Delta \log S_t + \beta_3 \Delta \log S_{t-1} + \beta_4 (\log S_{t-1} - \log I_{t-1}) + \beta_5 r_t + \beta_6 cov_t + \beta_7 t + \varepsilon_t$$

where I_t denotes either the real stock of inventories or fixed investment, S_t real sales, r_t the safe expected real rate of interest, cov_t the coverage ratio, and t the time trend[16]. The equations have been jointly estimated for small and large firms using Three Stages Least Squares. The results for inventory investment are presented in Table 9 and those for fixed investment in Table 10. The dependent variable is the logarithmic rate of change in the stock of inventories in the former, and the logarithmic rate of change in fixed investment in the latter.

The first set of results in Table 9 (in which the coefficient of the coverage ratio is constant through time for each type of firms) suggests that demand factors are more important for large

16 The fitted value obtained from a simple first order autoregressive model has been used as a proxy for expected inflation.

firms. The safe rate of interest has the expected negative sign and is significant for both groups of firms at the 5% level in a one tail test. More importantly the coefficient of the coverage ratio, β_6, is very significant for small firms, but not for large firms. Actually the coverage ratio is the only variable (in addition to the trend and the interest rate) whose coefficient is precisely determinated in the equation for small firms. The hypothesis that the coverage ratio coefficients for small and large firms are equal can be rejected at the 5% significance level. Note that the coefficient for small firms is four times greater than the one for large firms..

When the coverage ratio coefficient is allowed to differ between periods of monetary tightening and periods of monetary expansion, the point estimates suggest that β_6 is higher for small firms in times of monetary stringency. Both coefficients are significant. Both coefficients are also significant for large firms, yet they are half the size than the corresponding coefficients for small firms. The tests for pairwise equality of coefficients suggest that the differences between the coefficients in periods of tightness and expansion are significant at the 10% level for small firms and at the 5% level for large firms. The precision of the estimates does not, however, allow us to reject at conventional levels the equality of the coefficients between small and large firms in either expansion or recession, in spite of the substantial numerical difference that exists.

In Table 10 we summarize the results for the fixed investment equation. We have experimented with specifications including and excluding the expected real safe rate of interest. Its coefficient in all cases was positive and often significant. The ranking of the coefficients for the coverage ratio was, however, identical in all the specifications. We report in the table the results that exclude the real rate. Again the demand variables are somewhat better determined for large firms. The coverage ratio is significant for small firms but not for large ones and the equality of the two coefficients is rejected at a 6.5% marginal significance level. Numerically, the coefficient for small firms is five time larger than the one for large firms.

When the coefficients are also allowed to differ between periods of monetary tightness and periods of monetary expansion, there is not a significant difference for small firms. The coefficients for large firms now become significant. The one for periods of tightness is twice the size than the one for periods of expansion, but the difference is not significant. The coefficients for large firms are approximatively half the size compared to the corresponding ones for small firms. The equality of the coefficients between large and small firms can be rejected at the 10% level during periods of expansion, but not during periods of tight money.

Overall, these results are quite supportive of the theories emphasizing the cross sectional and time series differences in the severity of financial constraints[17]. They are also consistent with the recent evidence from inventory equations for the US. Kashyap, Lamont and Stein (1992) using individual firm data, find that firms without bond rating are more sensitive to liquidity variables in periods of monetary tightening. Gertler and Gilchrist (1993c), using data from the Quarterly Financial Reports of Manufacturing Firms, find that small firms are more sensitive to changes in the coverage ratio than large firms. Similar results have also been obtained by Milne (1991) on UK panel data.

4. Conclusions

The evidence we have presented in this paper is consistent with those theories that emphasize the importance of agency and contract enforcement problems for certain categories of firms in explaining their response to business cycle shocks. The picture that emerges for small firms is indeed supportive of such explanations, in particular the greater drops in sales and inventories following negative demand shocks or episodes of tightness in monetary policy, the decrease in both bank and trade debt , the increase in the importance of retentions as source of funds, and the drop in short-term assets.

Large firms, instead, can rely initially on short-term bank debt that allows them to accumulate inventories at the onset of a recession and to smooth out production fluctuations. There is also some evidence that suggests that large firms are able to access funds through the long-term bond and/or stock market when they suffer a decrease in the other sources of external finance. On the whole, the evidence is consistent with the hypothesis that agency problems are more severe for small firms and that negative shocks, including monetary ones, have a more powerful effect on the premium they pay for external finance. In this situation it is not surprising that the amount of bank and trade debt decreases more for them in a recession or following episodes of monetary stringency[18].

Someone may claim that the heterogeneity in the real and financial responses by large and

17 The basic conclusions do not change if we allow also the coefficients of the lagged dependent variable and of the current and lagged rate of growth in sales to differ between periods of monetary tightness and expansion.

18 See Gertler and Gilchrist (1993a).

small firms may also have other explanations, not based on different degrees of capital market imperfections faced by firms. As we have already pointed out, a possible story based on the conjecture that small firms may be in sectors in which demand fluctuations are more severe is not appropriate for our sample. Yet it cannot be excluded that differences in behavior may reflect technological or other structural differences between small and large firms. For instance, small firms may be more flexible and hence display greater sales fluctuations because of the greater regulatory burden and trade union restrictions that characterize large firms. Given the nature of the small firms in our sample (small firms are large enough to be subject to the same labor laws as large ones and it is unlikely that there are significant differences in the degree of unionisation of their work force) this explanation does not sound very convincing. Note, for instance, that there is not much difference in the number of hours lost for strike (as a percentage of total hours) between small and large firms (see Table 1).

In any case, our econometric results on the greater excess sensisitvity of both inventory and fixed investment decisions by small firms to proxies of credit worthiness constitute additional independent evidence that net worth considerations are important in amplifyng the consequence of negative business shocks for such firms. The fact that particularly in periods of monetary stringency there is evidence of excess sensitivity also for large firms suggests that the financial effect is likely to be powerful in the aggregate. It is not easy to rationalize these findings using an explanation based on technology or other structural factors.

Obviously our results are not definitive. In particular they are based on data that have been aggregated for each category of firms. Further progress in this area can be achieved by using panel data for individual firms and this is what we are doing at the moment. However, the evidence presented so far suggests that the heterogeneity in firms response to negative shocks, including those caused by monetary restrictions, is an important element to be taken into account in order to understand the nature of business cycle fluctuations in Italy.

Appendix: Monetary Policy in Italy and the Identification of Tight Money/Credit Episodes.

The goal of this appendix is to identify episodes of tight money/credit in order to investigate the differential response of small and large manufacturing enterprises to credit restrictions.

A.1 The institutional context and an overall view of monetary policy.

In the Sixties, price stability ceased to be the sole (or at least dominant) target for Italian monetary policy. From then onward, objectives such as facilitating investment and high levels of demand increased importance as final targets of monetary policy. Given these prorities, there was a recurring problem of controlling the country's external deficit, so that monetary policy shifts represent often reactions to balance of payments problems or foreign currency crises. This gave monetary policy a "stop and go" quality (see, among others, Spinelli and Fratianni (1991)).

In the Seventies, the increase in Government expenditure and the growth of the Public Sector Borrowing Requirements had a fundamental impact on the setting of monetary policy. High levels of inflation were tolerated to avoid employment consequences (on average the inflation rate differential with respect to G7 was 4.5%, see De Grauwe and Fratianni (1985)). To finance the public sector's deficit, the component of automatic monetary base creation through the Treasury's current account with the Bank of Italy became increasingly more important[19] . On the other hand, both households' savings and banks' assets were forcedly drawn toward government securities by raising administrative barriers to capital movements as well as by requiring banks to hold government securities as a form of collateral reserve ("vincolo di portafoglio").

In terms of choice of intermediate objectives, monetary authorities after the first oil shock resolved to define them in terms of monetary aggregates instead of interest rates (see Caranza and Fazio (1984)). Thereafter, discount rate policies were accompanied, and partly replaced, by a widespread use of administrative instruments to restrict or expand monetary and - especially - credit aggregates[20]. Given the not fully developed nature of financial markets, monetary

19 The share in the public deficit that was financed by monetary base creation grew from 62.4% in the Sixties to 74.1% in the period 1970-76.

20 These include credit ceilings to banks' lending, compulsory interest-free deposits with the central bank for excessive lending, regulation of bank acceptances issues, compulsory deposits on foreign currency purchases, extension of reserve requirements to repurchase agreements, and of course the constraint on banks' financial portfolios. Direct credit controls - and especially credit ceilings - were preferred on the grounds that they were expected to be more effective in generating a quick reduction in credit supply than monetary base control (Fazio (1979)). Finally, a set of regulations on foreign currency operations was also operative.

authorities considered the control of credit expansion to be more important than the control of money supply (see Caranza and Fazio (1984), p.69).

More precisely, Total Domestic Credit (TDC) became the leading indicator of Italian monetary policy after 1974, when a most severe balance of payments crisis occurred and an IMF stand- by agreement was negotiated. TDC includes domestic lending to the economy (households and enterprises) as well as the domestic component of PSBR, thus excluding borrowing from abroad and corporate equities[21].

The behavior of monetary authorities in the Seventies has been criticized for having submitted monetary policy to the objectives of fiscal policy (see, among the others, Spinelli and Fratianni (1991)). Moreover, by heavily relying on administrative instruments and capital markets constraints, severe distortions could be introduced. Finally the choice of Total Domestic Credit has also been criticized on the grounds that, inasmuch as it takes the public deficit as given, the only way to keep TDC within the set value is to curb credit to the private sector (see Caranza and Fazio (1984), p.74).

In the late seventies and in the early eighties there has been an attempt to give the central bank greater autonomy and to allow it to move away from administrative quantity controls. The so-called "divorce" between the Bank of Italy and the Treasury that took place in July 1981 put an end to the practice whereby the Bank of Italy bought government securities not placed with the public or the banks independently of consistency with the control of the monetary base. Moreover, the abolition of the ceiling on bank loans in June 1983 (although reimposed for brief periods in 1986 and in 1987) was a further signal of the return to market-oriented instruments of monetary control. This has been followed in 1988 by the revision of the foreign currency regulation as well as by the liberalization of banks' capital movements, in preparation for the full liberalization of capital movements that took place in 1990.

Finally, by entering the EMS in 1979, the Italian government imposed a more severe discipline on both fiscal and monetary policy which directly induced a process of restructuring within manufacturing industry. This resulted in a greater emphasis on the stability of the exchange rate within the EMS (until the crisis in 1992) than the control of inflation per se as a target of monetary policy. It has nonetheless been shown that the exchange rate policy has been crucial in lowering inflation (Gressani, Guiso and Visco (1987)).

A2. Identification of monetary tightness episodes.

Given the emphasis on external constraints (either balance of payments' deficits or exchange rate of the lira), we looked for times when concern about both the external accounts or inflation led Italian monetary authorities to attempt to induce a slowdown in the economy.

In order to identify monetary shocks we first looked for references to monetary tightenings in the Annual Reports of the Bank of Italy. We then screened policy decisions concerning official discount rates (as they are perceived as signals, after all) and interest rates in

21 TDC differs from the Total Debt of Domestic Non-financial Sectors (which the Federal Reserve Board has been monitoring since February 1983) in that the latter includes borrowing from abroad. For a detailed justification of the choice of Total Domestic Credit as an intermediate target, see Caranza and Fazio (1984), Penati and Tullio (1983) and Caranza (1977).

general. Given their relevance for Italian monetary policy, we finally paid great attention to variations in both monetary and credit aggregates and to the quantity constraints imposed on the latter during certain periods.

On this basis, we identify five times from 1968 to 1991 when the Bank of Italy moved to induce a recession - or at least a growth recession - to alleviate balance of payment problems, and to control inflation and/or the external parity of the lira. They are 1970, 1974, 1976-77, 1980-81, and possibly 1986.

January-June 1970. Following three years of price and interest rates stability as well as aggregate demand, export and investment growth, at the end of 1968 an increase in the prices of raw materials and semi-finished products raised both inflationary expectations and a concern about external current accounts. On the other hand, as interest rates differentials on the international capital markets were widening[22] , large capital outflows - both legal and illegal - caused the Bank of Italy to require banks to balance their net financial position abroad, and to reduce and then terminate credit extended to non residents. Whereas the official discount rate was raised from 3.5% to 4% in August 1969 (see Figure A.2), after eleven years of no change, the most important measure was taken by the Bank of Italy in May, when the three years practice of sustaining the prices of government securities was interrupted, and interest rates were allowed to rise. Following a sharp fall in securities' demand, long-term credit institutions' source of funds dried up, thus contracting financing to fixed investment as well as shifting companies' demand for credit to banks[23].

However bank credit expansion continued throughout 1969[24]. The Bank of Italy had both to re-enter the security market to avoid collapse and to refinance banks and, as a result, the initial attempt at monetary restriction was reversed or, at least, eased. Contractionary influences became stronger in the first half of 1970, when the discount rate was again raised to 5.5% and interest rates kept rising. The perception of the Bank of Italy was that credit restrictions were rationing credit to small- medium enterprises. For large companies, the restrictions were partly offset by foreign currency short-term loans (Bank of Italy, Annual Report (1970), p.230). Our overall impression is that while there was an attempt to adopt tighter policies in 1969, it is only in the first semester of 1970 that the restriction actually takes place. Monetary policy again adopted an expansionary stance in June. However, in order to respond to inflationary pressure, taxes were raised and a slow down in economic activity occurred that lasted until the end of 1972 (see Figure A.1).

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22 Interest rates on government securities were in fact held artificially low by the so-called "policy of stabilization" by the Bank of Italy (see Fazio (1979) for a detailed overview of the period).

23 Up to 1993 Italian banks were only entitled to issue short term credit, whereas medium and long-term finance was supplied by other credit institutions (Special Credit Institutions, or Istituti di Credito Speciale, i.e. ICS). However it was accepted practice that the largest banks owned controlling interests in ICSs.

24 Credit demand from enterprises steadily rose in 1969 as a result of both a slowing in economic expansion and widespread labour force strikes.

March 1974 - March 1975. In June 1973, in response to deteriorating external accounts and inflationary pressures, the Bank of Italy ceased pursuing an expansionary policy. By asking banks to increase their stocks of long-term securities of Special Credit Institutions and then (July) by imposing a credit ceiling to the expansion of large-sized loans, monetary authorities attempted to slow down credit growth and at the same time avoid rationing small firms. Only at the beginning of 1974, however, the effects of the first oil shock were fully perceived and a shift to a much tighter policy occured. Faced with unusually high external deficits and inflation rates (wholesale prices rose by 20% and consumer prices by 6% from December to March), a program of economic stabilization to curb aggregate demand was decided by the Italian Government, whereby the official discount rate was raised from 6.5 to 9%. More importantly, however, following an IMF stand-by agreement the expansion of Total Domestic Credit, the newly introduced intermediate target, was fixed to quite a low level (22.400 billion lira by the end of March 1975). In order to restrict financing to the economy, a credit ceiling on all loans was imposed in April, and a limit was set to the automatic monetary base creation through the Treasury's account. However, by excluding foreign loans from the definition of the credit aggregate used as intermediate objective, monetary authorities were allowing the restriction to credit to be partly offset by inflows of capital that would finance the short-term requirements by enterprises. On the other hand, in order to control for the loss of official reserves, a compulsory deposit on foreign currency purchases was imposed.

The contractionary influences were even stronger than expected - the growth rate of TDC was 2 points below the target and the share of credit to enterprises fell from 15 to 11 percent of GDP (see Figure A.3 for the evolution of the TDC growth rate). Bank short-term interest rates rose from 10.1% in 1974:1 to 17.9% in 1975:1 (although real lending rates still remain negative, see Figure A.4). By the end of 1974, industrial output had declined by 10%, the balance of payments had considerably improved, whereas real GDP rose by 5.6% in 1974 and fell by 2.8% in 1975. Although in 1974 the GDP deflator increased 6 percentage points faster than the target value, in 1975 the inflation rate fell from 24.4% to 11.3% (see Caranza and Fazio (1984)). Following Government pressures to mitigate the ongoing recession, in the second quarter of 1975, a shift to expansionary monetary policy occurred. Industrial output responded the following year and steadily increased until the end of 1976.

March 1976-June 1977. Following an uncontrolled increase in PSBR and a new serious crisis on exchange rate markets, steps to tighten policy were taken in early 1976. The shift was aimed at strengthening the weak lira as well as making domestic demand growth consistent with balance of payment equilibrium.

Progressively tighter measures were taken, although monetary authorities' stated intent was clearly not to dampen the ongoing economic recovery. These actions included the temporary closing of the foreign exchange market, higher reserve requirements, and an increase in the discount rate from 6 to 12% in three steps from January to March. Beginning in March 1976, new regulations of foreign currency movements were introduced and credit restrictions were imposed to combat illegal capital outflows as well as preventing further depreciations of the exchange rate from fuelling inflation[25].

25 A wage indexation mechanism had in fact been introduced in 1975 that made the economy more vulnerable to

Credit controls included both banks' portfolios constraints and credit ceilings which excluded foreign currencies loans (in order to favour short-term capital inflows). Enterprises largely profited from this advantageous source of finance and mostly used it for external trade operations (Bank of Italy, Annual Report (1977), p. 259). The same measures were reimposed in early 1977, just before a new stand-by agreement was negotiated with the IMF, whereby a ceiling to TDC expansion was set.

The restrictive policies had a more powerful real effect in 1977 than in 1976 - the GDP real growth rate fell from 6.2 to 3.6%, consumer prices rose by 22% in 1976, but only by 12.7% in 1977, and real interest rates eventually turned positive in 1977. Although the TDC/GDP ratio declined in 1976, its expansion exceede the targets set by the IMF both in 1976 and in 1977. On the other hand, the domestic PSBR share in TDC rose from 41.7 to 50.2%, possibly crowding out credit to the economy[26].

Monetary policy was progressively loosened in the summer 1977, when the discount rate was decreased from 15 to 11.5% in two steps, and bank real interests started to decline. Contractionary influences on credit supply persisted up to September. Output started to recover in 1978.

March 1980-December 1981. In 1979 two major events affected monetary policy in Italy - the second oil crisis and the entry into the EMS, the former influencing the decision process in the short run, the latter throughout the Eighties.

In response to new pressures on the exchange rate of the lira, monetary policy again adopted a restrictive stance in the autumn of 1979. The discount rate was raised from 10.5 to 15% in two steps and a credit ceiling was imposed on bank credit. However loans below 130 billions lire were initially excluded, the intent being not to ration small firms. As inflation kept rising and credit restrictions were circumvented, steps to tighten policy were taken in 1980. A compulsory interest-free deposit with the central bank was introduced for excess lendings, a more restrictive credit ceiling was imposed and the discount rate was raised to 16.5%. The fast growth of public sector's deficit as well as the development of new forms of financial intermediation made such measures less effective in slowing down both domestic demand and inflation. As a source of finance, in fact, some enterprises were increasingly relying on both foreign currency loans excluded from the ceiling and bank acceptances - a new instrument which directly links private investors and firms, under bank guarantee. Furthermore, large companies could circumvent credit ceilings by fractioning their credit demands and began to issue medium- long term debts on international capital markets. The Bank of Italy suggests however that small firms expanded their share in total credit to the economy (both short and long-term credit) as they were now viewed as less risky than in the past by the banking system (Bank of Italy, Annual Report (1980), p.229).

On this account, in 1981 monetary policy was further restricted by regulating bank acceptances' issues as well as by imposing a more restrictive credit ceiling on all loans in lire. In

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inflationary pressures from abroad (Caranza and Fazio (1984)).

26 Although credit to the economy with respect to GDP fell from 13.5 to 9.5% from 1975 to 1977, the Bank of Italy believed that the credit ceilings operated to the advantage of small medium firms in both years (Bank of Italy, Annual Report (1977), p.266).

addition the discount rate was raised to 19%, and a new import-deposit scheme was imposed. The weakness of the lira within the EMS induced the Italian Government to devaluate the exchange rate twice during the year. Eventually real GDP growth was dampened, inflation (slightly) slowed down, and real interest rates turned positive. However, the country's external accounts did not significantly improve, PSBR continued to expand and the target value of TDC was exceeded, in spite of the "divorce" between the Bank of Italy and the Treasury.

In early 1982, a gradual change in policy was called for in the face of evidence of essentially zero output growth. The economy started to recover only in the second half of 1983.

January-March 1986. In order to combat devaluation expectations as well as speculative excesses in foreign exchange markets a monetary contraction was imposed in January 1986. Steps to tighten policy had already begun in 1985, but monetary restrictions had failed to increase bank interest rates, at least in nominal terms (Angeloni and Gaiotti (1990) and Bank of Italy, Annual Report (1986), p.211).

Actions on the part of the monetary authorities included the increase in Treasury Bills' interest rates, a bank credit ceiling with compulsory free-interest deposit for excessive lending, and the compulsory financing of export with foreign loans. The monetary restraint as well as the raw material price decrease induced both an appreciable slowing of inflation and an improvement in external accounts. At the same time, credit to the economy, especially short-term bank credit to large private enterprises, decreased in the first quarter, although foreign currency loans were allowed to expand. The restriction lasted until March-April 1986, although domestic credit fell for more than one quarter. Interestingly, however, enterprises had been improving their profitability over recent years, and some of them were increasingly relying on the stock exchange market and on alternative sources of debt finance for their financial requirements [27]. Consequently it is not clear what the effects of supply and demand factors are in the slowdown of credit to the private sector. The economy did not show any appreciable decrease in its growth rate.

27 During the eighties large enterprises gradually diversified sources of debt finance by directly accessing international capital markets, turning to financial (non-bank) institutions (e.g. investment funds, merchant banks, etc.) and by creating financial holdings to achieve a more efficient management of both liquidity and inventories.

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Table 1
Descriptive Statistics for Mediobanca Sample of Small and Large firms

	Small Firms			*Large Firms*		
	68-79	*80-91*	*68-91*	*68-79*	*80-91*	*68-91*
Employment	143	144	143	978	776	876
Hours Lost in Strike/Total Working Hours (%)	2.04	1.14	1.59	2.72	1.18	1.95
Profit Rate (%)	1.16	1.73	1.44	-0.27	1.30	0.51
Investment Rate (%)	6.53	4.24	5.38	5.50	4.18	4.84
Growth in Real Sales (%)	10.00	1.72	4.88	2.60	-0.34	5.80
Export / Sales (%)	12.99	18.25	15.62	20.92	20.58	20.75
Inventory / Sales (%)	21.41	20.16	20.79	15.54	14.12	14.83
Trade Credit/Total Assets (%)	27.03	26.46	26.75	18.08	22.24	20.16
Cash/Total Assets (%)	2.76	4.24	3.50	2.34	2.43	2.38
Treasury Bills/Total Assets (%)	0.29	2.28	1.29	0.58	3.86	2.22
Total Debt/Total Assets (%)	46.07	44.81	45.44	45.78	45.08	45.43

Data source: Mediobanca, Dati Cumulativi di 1790 Società Italiane (1992).

Table 2
Debt Structure

	Small Firms			*Large Firms*		
	68-79	*80-91*	*68-91*	*68-79*	*80-91*	*68-91*
ST[1] Debt	.82[2]	.80	.81	.70	.71	.70
Bank	.34	.25	.30	.25	.19	.22
Trade	.33	.32	.33	.25	.30	.27
Group	.00	.02	.01	.04	.06	.05
Other	.15	.20	.18	.16	.16	.16
LT[1] Debt	.18	.20	.19	.30	.29	.30
Bank	12	.13	.12	.22	.18	.20
Marketable	.04	.04	.04	.04	.02	.03
Group	.01	.02	.01	.04	.07	.06
Other	.01	.01	.01	.01	.02	.01
Total Bank	.46	.38	.42	.46	.37	.42

(1) ST = short term; LT = long term.

(2) All figures are expressed as proportions of total debt.

Data source: Mediobanca, Dati Cumulativi di 1790 Società Italiane (1992).

Table 3
Sources of Funds

	Small Firms			*Large Firms*		
	68-79	*80-91*	*68-91*	*68-79*	*80-91*	*68-91*
Retained Earnings	.37[1]	.44	.40	.33	.40	.37
New Share Issues	.12	.08	.10	.08	.19	.14
New Debt	.51	.49	.50	.58	.42	.50

(1) All figures are expressed as proportions of total sources.

Data source: Mediobanca, Dati Cumulativi di 1790 Società Italiane (1992).

Table 4
Industrial Composition of the two samples
(percentage out of Total Sales)

Sectors	*Large Firms*	*Small Firms*
Food	10.7	14.7
Paper and Publishing	4.1	6.3
Chemical, Pharmaceutical, and artificial fibers	11.6	11.8
Transport Equipment and Shipping	18.8	2.2
Electrical and Electronic Engeneering	14.2	1.1
Rubber	3.0	3.5
Engineering	2.5	0.0
Construction	2.3	6.2
Mechanical	5.9	21.0
Mining	0.0	1.1
Clay and Cement	1.9	8.6
Ferrous Metals	3.4	4.6
Textile and Apparel	3.7	12.2
Glass	0.9	0.0
Energy	9.9	0.0
Services	5.5	0.0
Other	1.6	6.2

Data source: Mediobanca.

Table 5
Cross–correlation coefficients between liabilities, assets, sources of funds and the weighted indeces of production (1971–91)

LARGE FIRMS

	r(−2)[1]	r(−1)	r(0)	r(1)	r(2)
SALES	0.004	0.096	0.457 **[2]	−0.387 *	0.016
INVENTORIES	−0.073	0.460 **	0.214	−0.227	0.317
INVESTMENT	−0.052	0.511 **	0.090	−0.322	0.363
TOTAL DEBT	0.193	0.134	0.163	−0.255	0.021
SHORT–TERM DEBT	−0.005	0.207	0.342	−0.491 **	0.157
TRADE DEBT	−0.092	0.139	0.622 **	−0.237	−0.126
NET TRADE CREDIT	0.220	−0.041	−0.570 **	0.584 **	−0.269
SHORT–TERM BANK DEBT	−0.150	0.457 **	−0.165	−0.457 **	0.234
CASH	0.051	−0.664 **	0.373	0.292	−0.288
TREASURY BILLS	−0.686 **	−0.188	0.210	−0.057	0.153
LONG–TERM BANK DEBT	0.380	0.177	−0.041	0.274	−0.537 **
LT–MARKETABLE DEBT	0.029	−0.125	−0.002	0.152	0.013
RETAINED EARNINGS	−0.133	−0.364	0.693 **	−0.049	−0.204
NEW SHARE ISSUES	0.028	0.011	0.336	−0.274	−0.001

SMALL FIRMS

	r(−2)	r(−1)	r(0)	r(1)	r(2)
SALES	−0.202	0.034	0.799 **	−0.278	0.002
INVENTORIES	0.331	−0.118	0.394 *	0.113	−0.116
INVESTMENT	−0.024	−0.014	0.681 **	−0.033	0.185
TOTAL DEBT	0.109	−0.173	0.776 **	−0.051	−0.265
SHORT–TERM DEBT	0.081	−0.298	0.765 **	−0.026	−0.275
TRADE DEBT	0.180	−0.465 **	0.578 **	0.344	−0.342
NET TRADE CREDIT	−0.578 **	0.324	0.060	0.004	0.176
SHORT–TERM BANK DEBT	−0.058	0.059	0.551 **	−0.172	−0.003
CASH	0.467 **	−0.209	0.001	0.002	0.330
TREASURY BILLS	−0.088	−0.499 **	0.002	0.520 **	−0.164
LONG–TERM BANK DEBT	0.006	0.240	0.187	−0.207	−0.129
LT–MARKETABLE DEBT	−0.015	0.086	0.291	0.392 *	−0.103
RETAINED EARNINGS	0.042	−0.279	0.661 **	0.288	−0.358
NEW SHARE ISSUES	0.295	−0.079	0.350	0.050	0.022

(1) r(m) denotes the cross–correlation coefficient between the detrended growth rate of various balance sheet items at time t and the detrended growth rate of the appropriate weighted index of production at time t+m. The GDP implicit price deflator is used to deflate all balance sheet items, except for inventories. For inventories we have used a weighted price index constructed using the GDP deflator and the price index of raw materials (with weights equal to two thirds and one third respectively).

(2) * denotes significance at the 10% level and ** at the 5% level.

Table 6
Cross-correlation coefficients between various mixes, and the weighted indeces of industrial production (1971-91)

LARGE FIRMS

	r(-2)[1]	r(-1)	r(0)	r(1)	r(2)
ST-Bank Debt / ST-Bank Debt+Trade Debt	-0.071	0.300	-0.507 **[2]	-0.276	0.221
ST-Bank Debt / Total Bank Debt	-0.323	0.309	-0.133	-0.549 **	0.509
Marketable Debt / Merketable Debt+LT-Bank Debt	-0.091	-0.167	0.022	0.039	0.196
Retentions / Source of Funds [1]	-0.204	-0.210	0.003	0.483 **	-0.281
New Share Issues / Source of Funds [1]	0.078	-0.055	0.172	-0.224	0.106
Retentions / Source of Funds [2]	0.028	-0.447 *	0.104	0.375	-0.347
New Share Issues / Source of Funds [2]	0.140	-0.093	0.174	-0.228	0.031

SMALL FIRMS

	r(-2)	r(-1)	r(0)	r(1)	r(2)
ST-Bank Debt / ST-Bank Debt+Trade Debt	-0.177	0.423 *	-0.062	-0.393 *	0.254
ST-Bank Debt / Total Bank Debt	-0.027	0.423 *	0.358	0.052	0.111
Marketable Debt / Merketable Debt+LT Bank Debt	0.000	-0.107	0.070	0.389	0.009
Retentions / Source of Funds [1][3]	-0.168	0.419 *	-0.603 **	0.164	0.063
New Share Issues / Source of Funds [1]	0.204	0.236	-0.255	-0.013	0.202
Retentions / Source of Funds [2]	0.012	0.103	-0.464 **	0.247	-0.107
New Share Issues / Source of Funds [2]	0.341	0.002	-0.206	0.080	0.709 **

(1) r(m) denotes the cross-correlation coefficient between the real detrended growth rate of the various mixes at time t and the detrended growth rate of the appropriate weighted index of production at time t+m.

(2) * denotes the significance at the 10% level and ** at the 5% level.

(3) [1] Source of Funds= Retentions + New Total Debt + New Share Issues
[2] Source of Funds= Retentions + New Total Financial Debt + New Share Issues

Table 7

Response of various balance sheet Items to monetary tightness dummy

(Sample 1968 - 1991)

		Coefficients on			F–statistic	Impulse Responses [1]			
Variable	Firm size	T [2]	T_{-1}	T_{-2}		0	1	2	3
Sales	small	.02051 (.62651) [4]	−.08457** [3] (−2.74618)	.00144 (.03813)	2.87140 |.069|	.02051 (.62651)	−.06613 (−1.46333)	−.05594 (−.93439)	−.05697 (−.98425)
	large	.01938 (.67691)	−.03958 (−1.47329)	−.00246 (−0.08597)	1.02971 |.406|	.01938 (.67691)	−.02339 (−.61560)	−.01882 (−.37469)	−.01957 (−.41401)
Inventory	small	.00721 (.19740)	−.07143* (−2.10181)	−.01933 (−.49086)	1.62501 |.223|	.00721 (.19740)	−.06425 (−1.22095)	−.08237 (−1.17014)	−.08204 (−1.17215)
	large	.04280 (1.09557)	−.07290* (−1.92751)	−.04976 (1.26569)	2.87713* |.069|	.04280 (1.09557)	−.01788 (−.27252)	−.08497 (−.91677)	−.10415 (−1.011517
Total debt	small	−.00359 (−.12120)	−.06781** (−2.46293)	.00998 (.28774)	2.19684 |.128|	−.00359 (−.12120)	−.07130* (−1.67078)	−.05923 (−1.03875)	−.05960 (−1.04370)
	large	.00150 (.06266)	−.01432 (−.67127)	−.01117 (−.49811)	.24630 |.863|	.00150 (.06266)	−.01244 (−.31615)	−.02719 (−.49552)	−.03098 (−.52443)
Short–term debt	small	.00394 (.13456)	−.08476*** (−3.11077)	.01342 (.37516)	3.49139** |.040|	.00394 (.13456)	−.08129** (−2.02069)	−.05760 (−1.08210)	−.06046 (−1.15988)
	large	.01950 (.62761)	−.03888 (−1.36484)	−.01637 (−.52183)	1.03791 |.402|	.01950 (.62761)	−.02078 (−.48534)	−.03425 (−.60225)	−.03329 (−.60485)

Table 7 - continued

Variable	Firm size	Coefficient on T	Coefficient on T_{-1}	Coefficient on T_{-2}	F–statistic	Impulse Responses 0	1	2	3
Trade debt	small	–.02578 (–.58058)	–.11161** (–2.63605)	.04322 (.95389)	3.35433** [.045]	–.02578 (–.58058)	–.12888** (–2.46227)	–.05165 (–.73985)	–.07713 (–1.23644)
	large	.00568 (.12709)	–.06083 (–1.46485)	.00895 (.19722)	.77162 [.527]	.00568 (.12709)	–.05592 (–.92470)	–.03852 (–.48194)	–.04091 (.53504)
Net trade credit	small	.02063 (.42230)	.00276 (.06009)	–.02700 (–.58017	.24613 [.863]	.02063 (.42330)	.01885 (.29853)	–.00776 (–.09309)	–.00191 (–.02475)
	large	–.06241 (–.96803)	.00681 (.11449)	.01630 (.26922)	.45189 [.720]	–.06241 (–.96803)	–.05411 (–.58681)	–.03801 (–.30853)	–.03839 (–.31614)
Short–term Bank debt	small	–.01396 (–.26128)	–.08614* (–1.94643)	–.04461 (–.80880)	1.42571 [.272]	–.01396 (–.26128)	–.09679 (–1.53485)	–.12173 (–1.43428)	–.11580 (–1.52818)
	large	.02418 (.33853)	–.05397 (–.87277)	–.08598 (–1.29159)	1.09788 [.379]	.02418 (.33853)	–.03264 (–.35416)	–.11192 (–.91371)	–.10257 (–.89783)
Cash	small	.05399 (.86692)	.01717 (.28879)	.05521 (.92864)	.41626 [.744]	.05399 (.86692)	.05444 (.70882)	.10951 (1.07524)	.09246 (1.02199)
	large	–.01488 (–.15087)	–.05462 (–.60005)	.13675 (1.47807)	1.02494 [.408]	–.01488 (–.15087)	–.06634 (–.52661)	.08136 (.48791)	.04995 (.32172)
Treasury bills	small	–.08370 (–.47013)	–.00561 (–.03377)	.15892 (.94691)	.51268 [.679]	–.08370 (–.47013)	–.08914 (–.34689)	.06979 (.20310)	.06947 (.20262)

Table 7 - continued

Variable	Firm size	Coefficient on T	Coefficient on T_{-1}	Coefficient on T_{-2}	F–statistic	Impulse Responses 0	1	2	3
T–bills (cont.)	large	.21558 (1.31335)	.16623 (1.05489)	.10995 (.68430)	.85301 [.485]	.21558 (1.31335)	.40078 (1.59657)	.52702 (1.54667)	.53812 (1.51658)
Long–term Bank debt	small	–.05545 (–1.03926)	.00643 (.13311)	–.06640 (–1.37620)	.82681 [.498]	–.05545 (–1.03926)	–.03903 (–.57658)	–.10839 (–1.20027)	–.09590 (–1.16036)
	large	–.08952* (–1.97073)	.01616 (.36339)	–.06179 (–1.51959)	1.91939 [.167]	–.08952** (–1.97073)	–.09469 (–1.30528)	–.15771 (–1.57541)	–.17272 (–1.62177)
Long–term marketable debt	small	–.06522 (–1.37149)	.08336* (1.83137)	–.00386 (–0.07968)	1.99085 [.156]	–.06522 (–1.37149)	–.00376 (–.04565)	.01302 (.11049)	.01866 (.14189)
	large	.15742* (2.07531)	.20034** (2.76085)	.15702* (1.96459)	3.93586** [.028]	.15742** (2.07531)	.35968*** (3.18612)	.51917*** (3.41915)	.52112*** (3.20463)
Earnings	small	–.04970 (–.48029)	–.20095** (2.22056)	.01392 (.13646)	1.76285 [.195]	–.04970 (–.48029)	0.24954* (–1.73604)	–.23113 (–1.21046)	–.23155 (–1.22917)
	large	–.12841 (–1.00950)	–.35278** (–2.88376)	.10167 (.69827)	3.76813 [.032]	–.12841 (–1.00950)	–.47884*** (–2.61993)	–.37075 (–1.51896)	–.37273 (–1.53846)
New Share Issues	small	.11636 (.36523)	–.09373 (–.31620)	.02033 (.06596)	.09049 [.964]	.11636 (.36523)	–.00078 (–.00185)	.04311 (.07787)	.03429 (.06643)
	large	.51827* (1.76510)	–.16293 (–.56426)	–.36327 (–1.20864)	2.48128* [.098]	.51827* (1.76510)	.16682 (.47502)	–.06861 (–.14579)	.01703 (.04238)

(1) T denotes the monetary tightness dummy.

(2) The impulse response function at 0, 1, 2, and 3 years lags, cuptures the response of each variable to a temporary one year tightening of monetary policy.

(3) * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

Table 7 - continued

Variable	Firm size	Coefficient on T	T_{-1}	T_{-2}	F–statistic	Impulse Responses 0	1	2	3
T–bills (cont.)	large	.21558 (1.31335)	.16623 (1.05489)	.10995 (.68430)	.85301 [.485]	.21558 (1.31335)	.40078 (1.59657)	.52702 (1.54667)	.53812 (1.51658)
Long–term Bank debt	small	–.05545 (–1.03926)	.00643 (.13311)	–.06640 (–1.37620)	.82681 [.498]	–.05545 (–1.03926)	–.03903 (–.57658)	–.10839 (–1.20027)	–.09590 (–1.16036)
	large	–.08952* (–1.97073)	.01616 (.36339)	–.06179 (–1.51959)	1.91939 [.167]	–.08952** (–1.97073)	–.09469 (–1.30528)	–.15771 (–1.57541)	–.17272 (–1.62177)
Long–term marketable debt	small	–.06522 (–1.37149)	.08336* (1.83137)	–.00386 (–0.07968)	1.99085 [.156]	–.06522 (–1.37149)	–.00376 (–.04565)	.01302 (.11049)	.01866 (.14189)
	large	.15742* (2.07531)	.20034** (2.76085)	.15702* (1.96459)	3.93586** [.028]	.15742** (2.07531)	.35968*** (3.18612)	.51917*** (3.41915)	.52112*** (3.20463)
Earnings	small	–.04970 (–.48029)	–.20095** (2.22056)	.01392 (.13646)	1.76285 [.195]	–.04970 (–.48029)	0.24954* (–1.73604)	–.23113 (–1.21046)	–.23155 (–1.22917)
	large	–.12841 (–1.00950)	–.35278** (–2.88376)	.10167 (.69827)	3.76813 [.032]	–.12841 (–1.00950)	–.47884*** (–2.61993)	–.37075 (–1.51896)	–.37273 (–1.53846)
New Share Issues	small	.11636 (.36523)	–.09373 (–.31620)	.02033 (.06596)	.09049 [.964]	.11636 (.36523)	–.00078 (–.00185)	.04311 (.07787)	.03429 (.06643)
	large	.51827* (1.76510)	–.16293 (–.56426)	–.36327 (–1.20864)	2.48128* [.098]	.51827* (1.76510)	.16682 (.47502)	–.06861 (–.14579)	.01703 (.04238)

(1) T denotes the monetary tightness dummy.

(2) The impulse response function at 0, 1, 2, and 3 years lags, cuptures the response of each variable to a temporary one year tightening of monetary policy.

(3) * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

Variable	Firm size	T	T_{-1}	T_{-2}	0	1	2	3
T-bills	large	.21558	.18624 -	.10595	.85301	.21538	.52702	.53812
(cont.)		(1.31135)	(1.05489)	(.68420)	(.4891)	(1.34135)	(1.59657)	(1.51658)
Long-term bank debt	small	−.05845	.00043	−.05040	.82661	−.03903	−.10839	−.09590
		(−1.09826)	(.14311)	(−1.17628)	(.4991)	(−1.03926)	(−.57658)	(−1.20027)	(−1.16036)
	large	−.08052*	.01616	−.06120	1.91959	−.08052**	−.09460	−.15771	−.17272
		(−1.57027)	(.26339)	(−1.31930)	(1.101)	(−1.97073)	(−1.30218)	(−1.57541)	(−1.65127)
Long-term marketable debt	small	−.00522	.08336*	−.00356	1.09085	−.06822	−.00376	.01802	.01866
		(−1.37149)	(1.83137)	(−0.07958)	(1.56)	(−1.37149)	(−.10435)	(1.11048)	(1.41869)
	large	.15742*	.20034**	.15702*	3.03386**	.15742**	.32068**	.51512**	.52112**
		(2.02531)	(2.76053)	(1.96463)	(1.024)	(2.02531)	(3.18012)	(3.41815)	(3.20462)
Earnings	small	−.04970	−.20095**	.01302	1.76285	−.04970	0.26054*	−.23113	−.23165
		(−.48029)	(2.22056)	(.13646)	(.195)	(−.48029)	(−1.73604)	(−1.21046)	(−1.22917)
	large	−.12841	−.33278**	.10167	3.76813	−.12841	−.42884***	−.37025	−.37273
		(−1.00950)	(−2.83276)	(.69827)	(.032)	(−1.00950)	(−2.61993)	(−1.51896)	(−1.53846)
New Share Issues	small	.11636	−.09373	.02033	.09049	.11636	−.00078	.04011	.03429
		(.36023)	(−.31620)	(.06596)	(.564)	(.36023)	(−.00185)	(.07187)	(.06643)
	large	.31827*	−.16293	−.36227	2.48128*	.31827*	.16082	−.05861	.01703
		(1.70510)	(−.59629)	(−1.23804)	(.0981)	(1.70510)	(.41702)	(−.14599)	(.04238)

(1) T denotes the monetary tightness dummy.

(2) The impulse response function at 0, 1, 2, and 3 years lags, explains the response of each variable to a temporary one year tightening of monetary policy.

(3) * indicates significance at 10%, ** indicates significance at 5%, *** indicates significance at 1%.

Table 8
Response of various Mixes to monetary tightness dummy
(Sample 1968 - 1991)

Mix	Firm size	Coefficients on T [2]	T_{-1}	T_{-2}	F–statistic	Impulse Responses [1] 0	1	2	3
Short–term Bank Debt (ST Bank + Trade Debt)	small	–.01591 [4] (–.46430)	.01806 (.64153)	–.05969* [3] (–2.11055)	1.71614 |.204|	–.01591 (–.46430)	.01065 (.32951)	–.06323 (–1.31660)	–.02377 (–.65941)
	large	.01188 (.29077)	–.00026 (–.00703)	–.05499 (–1.47813)	.94576 |.442|	.01188 (.29077)	.01154 (.20071)	–.04344 (–.56554)	–.04308 (–.57225)
Short–term Bank Debt Total Bank Debt	small	.01246 (.85716)	–.02687* (–1.98513)	.01064 (.67705)	1.72653 |.202|	.01246 (.85716)	–.01525 (–.74825)	–.00276 (–.10241)	–.00359 (–.132961)
	large	.05712 (1.70318)	.00031 (.00925)	–.01997 (–.61307)	1.49045 |.255|	.05712* (1.70318)	.03464 (.88583)	.02364 (.44965)	.02803 (.63225)
Long–term Marketable Debt (LT Market + LT Bank Debt)	small	–.01161 (–.20741)	.04219 (.85403)	.06059 (1.13894)	.81389 |.505|	–.01161 (–.20741)	.02956 (.35308)	.09378 (.82762)	.09945 (.87305)
	large	.22446*** (3.10136)	.16911** (2.33226)	.17367** (2.32576)	4.74145** |.015|	.22446*** (3.10136)	.42090*** (3.74375)	.61849*** (4.00833)	.64255*** (3.76166)
Retained Earnings Total Sources of Funds	small	–.09221 (–.66168)	.00016 (.00134)	–.03903 (–.31767)	.14811 |.929|	–.09221 (–.66168)	–.05747 (–.38848)	–.10953 (–.53056)	–.09001 (–.49628)
	large	–.23099 (–1.51461)	–.16721 (–1.03700)	.17768 (1.36380)	2.82999* |.074|	–.23099 (–1.51461)	–.30969* (–1.94813)	–.10186 (–.45613)	–.18149 (–.99802)

Table 8 - continued

Mix	Firm size	Coefficients on T	T_{-1}	T_{-2}	F–statistic	Impulse Responses 0	1	2	3
New Equity Issues / Sources of Funds	small	−.04923 (−.17580)	.20508 (.77662)	.04038 (.15015)	.22591 [.877]	−.04923 (−.17580)	.17235 (.51159)	.13845 (.30878)	.14981 (.38151)
	large	.32080 (1.19752)	.17828 (.66549)	−.10964 (−.43023)	.83880 [.493]	.32080 (1.19752)	.37630 (1.19654)	.24542 (.58400)	.29551 (.82034)

(1) T denotes the monetary tightness dummy.

(2) The impulse response function at 0, 1, 2, and 3 years lags, cuptures the response of each variable to a temporary one year tightening of monetary policy.

(3) * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

(4) Numbers in brackets are t-ratios; numbers in square brackets denote marginal significance levels.

Table 9
Inventory Equations

	Small Firms		Large Firms		Small Firms		Large Firms	
Constant	-0.3814	(-1.271)	-0.7352	(-3.946)	-0.1727	(-0.608)	-0.5811	(-3.369)
$\Delta \log I_{t-1}$	-0.1767	(-0.677)	0.2619	(1.751)	-0.2600	(-1.042)	0.2222	(1.671)
$\Delta \log S_{t}$	0.0902	(0.417)	0.8215	(3.430)	0.0054	(0.024)	0.5466	(2.618)
$\Delta \log S_{t-1}$	-0.3719	(-0.958)	0.0947	(0.335)	-0.2857	(-0.821)	0.0284	(0.113)
$\log S_{t-1} - \log I_{t-1}$	0.1248	(0.762)	0.4067	(3.164)	-0.0064	(-0.039)	0.2913	(2.408)
r_{t}	-1.6283	(-1.754)	-1.0335	(-1.762)	-1.3512	(-1.648)	-0.9880	(-1.970)
Cov_{t}	0.0790	(2.882)	0.0237	(1.361)	--	--	--	--
$D_{t} cov_{t}$	--	--	--	--	0.1014	(3.113)	0.0605	(3.017)
$(1-D_{t})cov_{t}$	--	--	--	--	0.0712	(2.968)	0.0324	(2.252)
Trend	0.0116	(1.909)	0.0024	(0.496)	0.0094	(1.699)	0.0033	(0.778)
R^2	0.363		0.570		0.471		0.694	
DW	2.414		2.099		2.319		1.945	
χ^2_1	3.918							
χ^2_2					1.431			
χ^2_3					2.315			
χ^2_4					2.963			
χ^2_5					4.131			

Instruments: $\Delta \log I_{t-1}$, $\Delta \log S_{t-1}$, $\Delta \log S_{t-2}$, $\log S_{t-1} - \log I_{t-1}$, r_{t-1}, Cov_{t-1}, Cov_{t-2}, $\Delta \log GDP_{t-1}$, Constant, and Trend in columns 1 and 2.
$\Delta \log I_{t-1}$, $\Delta \log S_{t-1}$, $\Delta \log S_{t-2}$, $\log S_{t-1} - \log I_{t-1}$, r_{t-1}, $Dcov_{t-1}$, $(1-D)cov_{t-1}$, ΔCov_{t-2}, $(1-D)cov_{t-2}$, $\Delta \log GDP_{t-1}$, Constant, and Trend in columns 3 and 4.

(1) $D_t = 1$ in periods of monetary tightening, 0 otherwise.

(2) The numbers in brackets indicate marginal significance levels. χ^2_1: test for the pairwise equality of the coefficients on cov between large and small firms; χ^2_2: test for the pairwise equality of the coefficients on $D_t cov_t$ (tightening) between large and small firms; χ^2_3: test for the pairwise equality of the coefficients on $(1-D_t)cov_t$ (expansion) between large and small firms; χ^2_4: test for the pairwise equality of the coefficients on D cov (tightening) and (1-D)cov (expansion) for small firms; χ^2_5: test for the pairwise equality of the coefficients on D cov (tightening) and (1-D)cov (expansion) for

Table 9
Inventory Equations

Table 10
Fixed Investment Equations

	Small Firms		Large Firms		Small Firms		Large firms	
Constant	-1.0250	(-2.241)	-0.7511	(-2.804)	-0.8632	(-1.583)	-0.6489	(-2.446)
$\Delta \log I_{t-1}$	-0.0763	(-0.372)	0.5099	(2.868)	-0.0310	(-0.144)	0.4501	(2.740)
$\Delta \log S_t$	0.7630	(1.500)	0.3383	(0.964)	0.6009	(0.952)	0.0148	(0.467)
$\Delta \log S_{t-1}$	-0.7340	(-1.536)	0.5051	(1.954)	-0.9050	(-1.520)	0.3920	(1.597)
$\log S_{t-1} - \log I_{t-1}$	0.2336	(1.832)	0.1895	(2.390)	0.1957	(1.290)	0.1594	(2.006)
Cov_t	0.1496	(2.524)	0.0275	(0.895)	--	--	--	--
$D_t cov_t$[1]	--	--	--	--	0.1646	(1.920)	0.0567	(1.873)
$(1-D_t)cov_t$	--	--	--	--	0.1417	(2.362)	0.0301	(1.040))
Trend	-0.0030	(-0.420)	0.0009	(0.195)	-0.0040	(-0.543)	0.0006	(0.143)
R^2	0.582		0.478		0.577		0.545	
DW	2.045		2.236		2.102		2.286	
χ^2_1	3.427							
χ^2_2					1.431			
χ^2_3					2.854			
χ^2_4					0.190			
χ^2_5					1.629			

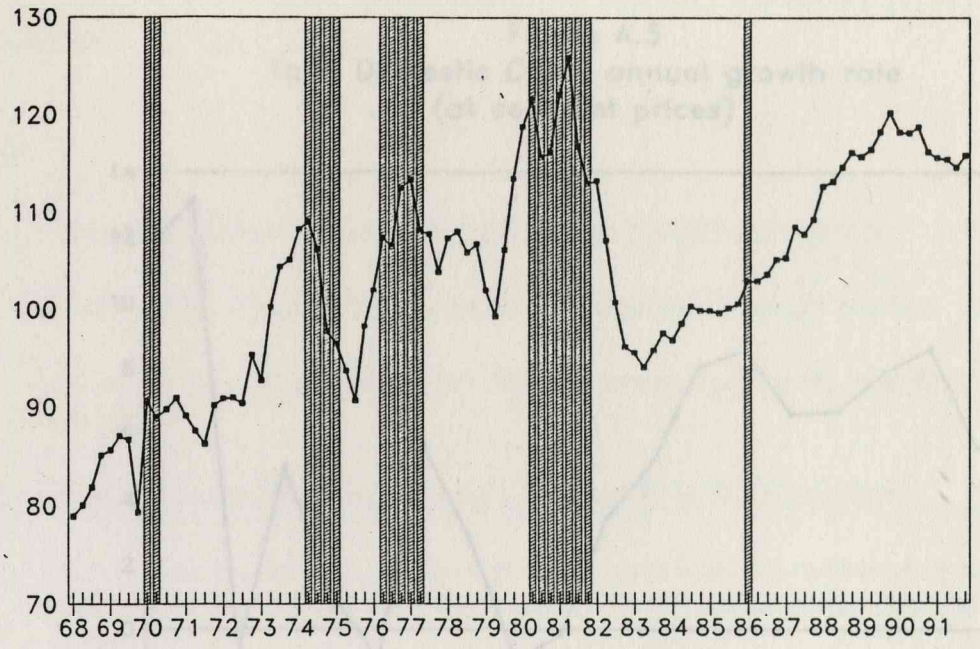
Instruments: $\Delta \log I_{t-1}$, $\Delta \log S_{t-1}$, $\Delta \log S_{t-2}$, $\log S_{t-1} - \log I_{t-1}$, Cov_{t-1}, Cov_{t-2}, $\Delta \log GDP_{t-1}$, Constant, and Trend in columns 1 and 2.
$\Delta \log I_{t-1}$, $\Delta \log S_{t-1}$, $\Delta \log S_{t-2}$, $\log S_{t-1} - \log I_{t-1}$, $Dcov_{t-1}$, $(1-D)cov_{t-1}$, ΔCov_{t-2}, $(1-D)cov_{t-2}$, $\Delta \log GDP_{t-1}$, Constant, and Trend in columns 3 and 4.

(1) $D_t = 1$ in periods of monetary tightening, 0 otherwise.

(2) The numbers in brackets indicate marginal significance levels. χ^2_1: test for the pairwise equality of the coefficients on cov_t between large and small firms; χ^2_2: test for the pairwise equality of the coefficients on $D_t cov_t$ (tightening) between large and small firms; χ^2_3: test for the pairwise equality of the coefficients on $(1-D_t)cov_t$ (expansion) between large and small firms; χ^2_4: test for the pairwise equality of the coefficients on $D_t cov_t$ (tightening) and $(1-D_t)cov_t$ (expansion) for small firms; χ^2_5: test for the pairwise equality of the coefficients on $D_t cov_t$ (tightening) and $(1-D_t)cov_t$ (expansion) for large firms. All the tests are distributed as χ^2 with one degree of freedom.

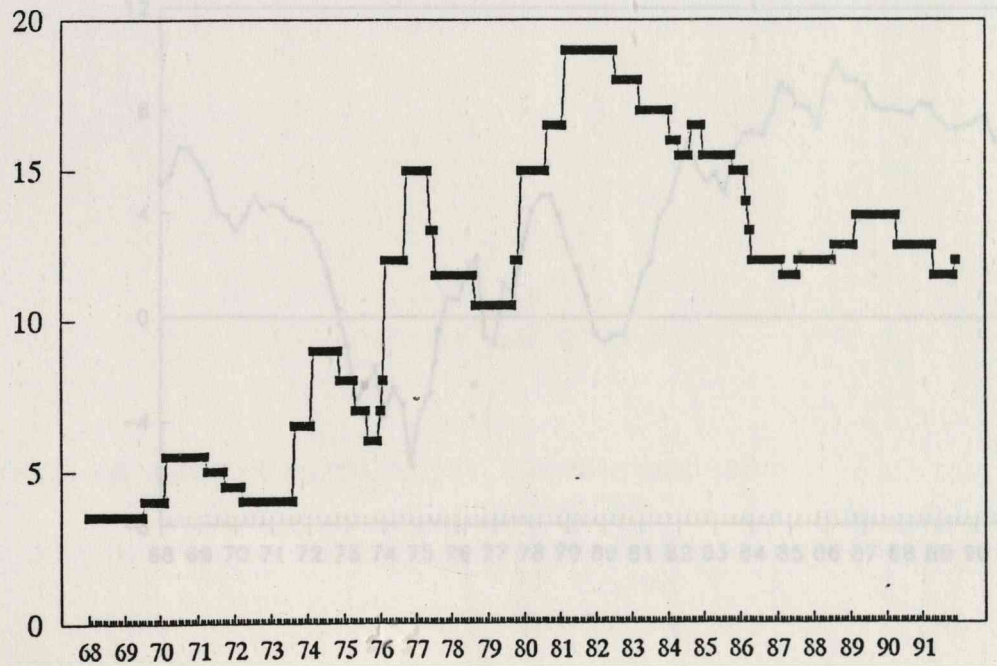
Table 10
Fixed Investment Equations

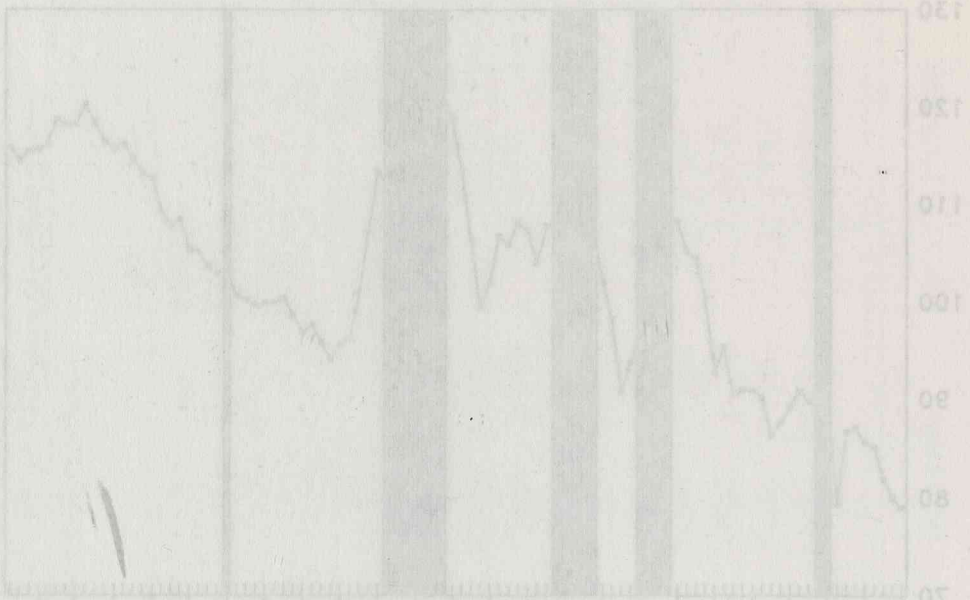
Figure A.1
Index of Industrial Production
(seasonally adjusted)



Note: The shaded regions indicate the periods of tight money/credit.

Figure A.2
Official Discount Rate

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120
110
100
90
80
70

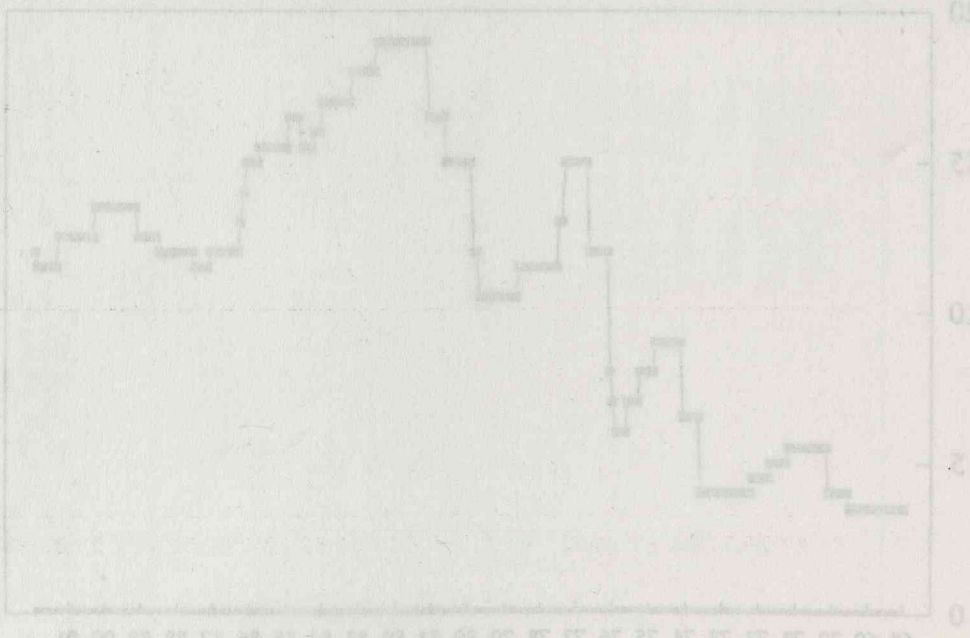

20
15
10
5
0

Figure A.3
Total Domestic Credit annual growth rate
(at constant prices)

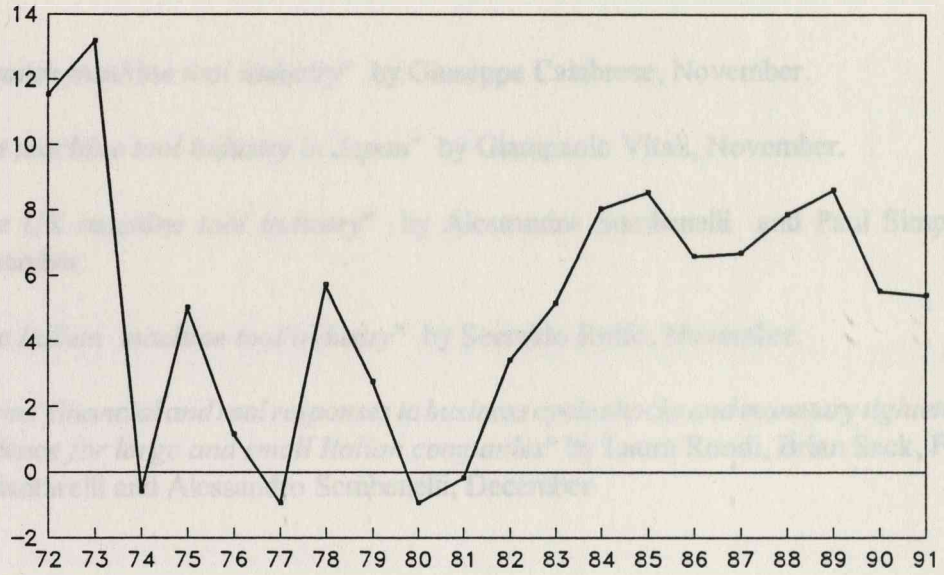
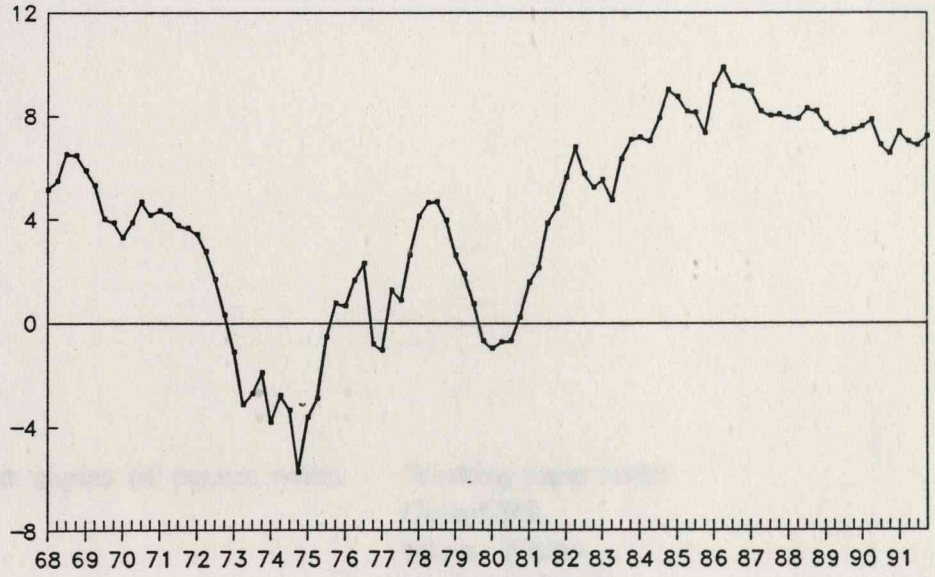
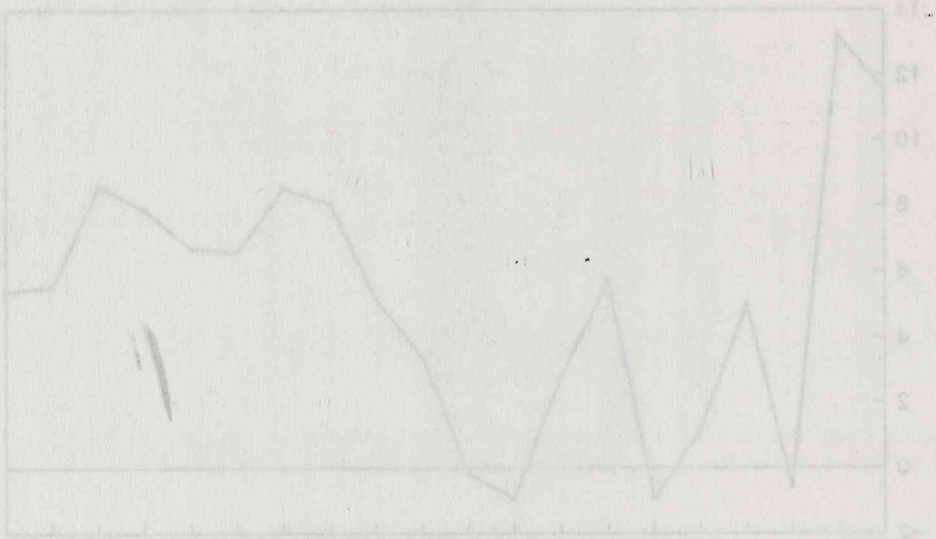


Figure A.4
Real Lending Rates





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